WHAT IS CLAIMED IS:

1. A biological assay method comprising:
delivering a sample liquid of a suspension of cells at a controlled steady flow rate through a biochip in the form of an elongate enclosed microchannel with an internal bore;
causing an externally generated test to be carried out on the sample liquid as it is being delivered through the biochip; and
examining the sample liquid over time to observe the effect of the test on the sample.

2. The biological assay method according to claim 1 comprising coating the internal bore of the biochip with a protein in the form of an extracellular matrix ligand to study cell attachments.

3. The biological assay method according to claim 1 comprising:
coating the internal bore of the biochip by seeding the biochip with endothelial cells; and
allowing the cells to grow and form an endothelial layer on the bore to study cell-cell interaction.

4. The biological assay method according to claim 1, wherein the cells are taken from an animal and the bore of the biochip is substantially the same size as the post capillary venules of the animal.

5. The biological assay method according to claim 1, wherein a reagent liquid is delivered simultaneously with the sample liquid through the biochip.

6. The biological assay method according to claim 1, further comprising delivering a reagent liquid at a controlled steady flow rate through another microchannel connected to the other microchannel, the channels being connected intermediate their ends by an interconnecting channel.

7. The biological assay method according to claim 1, further comprising delivering a reagent liquid at a controlled steady flow rate through another microchannel connected to the other microchannel, the channels being connected intermediate their ends by an interconnecting channel, the fluid pressure of the liquids being so chosen as to cause a diffusion of the reagent through the interconnecting channel and into the simple liquid.

8. The biological assay method according to claim 1, further comprising delivering a reagent liquid at a controlled steady flow rate through another microchannel connected to the other microchannel, the channels being connected intermediate their ends by an interconnecting channel, and the fluid pressures of the liquids are maintained equal to prevent diffusion of the reagent through the interconnecting channel.

9. The biological assay method according to claim 1, further comprising delivering a reagent liquid at a controlled steady flow rate through another microchannel connected to the other microchannel, the channels being

connected intermediate their ends by an interconnecting channel having a restricted entry throat.

10. The biological assay method according to claim 1, further comprising delivering a reagent liquid at a controlled steady flow rate through another microchannel connected to the other microchannel, the channels being connected intermediate their ends by an interconnecting channel having a restricted entry throat, the fluid pressure of the liquids being so chosen as to cause a diffusion of the reagent through the interconnecting channel and into the sample liquid.

11. The biological assay method according to claim 1, further comprising delivering a reagent liquid at a controlled steady flow rate through another microchannel connected to the other microchannel, the channels being connected intermediate their ends by an interconnecting channel having a restricted entry throat and the fluid pressures of the liquids are maintained equal to prevent diffusion of the reagent through the interconnecting channel.

12. The biological assay method according to claim 1, further comprising delivering a reagent liquid at a controlled steady flow rate through another microchannel connected to the other microchannel, the channels being connected intermediate their ends by an interconnecting channel having a restricted entry throat having a cross-section less than that of a cell freely suspended in the sample liquid.

13. The biological assay method according to claim 1, further comprising delivering a reagent liquid at a controlled steady flow rate through another microchannel connected to the other microchannel, the channels being connected intermediate their ends by an interconnecting channel having a restricted entry throat having a cross-section less than that of a cell freely suspended in the sample liquid, the fluid pressure of the liquids being so chosen as to cause a diffusion of the reagent through the interconnecting channel and into the sample liquid.

14. The biological assay method according to claim 1, further comprising delivering a reagent liquid at a controlled steady flow rate through another microchannel connected to the other microchannel, the channels being connected intermediate their ends by an interconnecting channel having a restricted entry throat having a cross-section less than that of a cell freely suspended in the sample liquid and the fluid pressures of the liquids are maintained equal to prevent diffusion of the reagent through the interconnecting channel.

15. The biological assay method according to claim 1, further comprising coating the bore of the microchannel with a hydrophobic coating and delivering a reagent liquid through the microchannel with the sample liquid.

16. The biological assay method according to claim 1, further comprising coating the bore of the microchannel with a liquid silicone and delivering a reagent liquid through the microchannel with the sample liquid.

17. The biological assay method according to claim 1, wherein the sample liquid contains more than one cell type in suspension.

18. The biological assay method according to claim 1, further comprising delivering a reagent liquid and the sample liquid through the microchannel to form multilaminar flow.

19. The biological assay method according to claim 1, further comprising:

delivering a reagent liquid and a sample liquid through a microchannel to for multilaminar flow, the sample liquid comprising a plurality of cell types in suspension and the reagent liquid comprising a chemoattractant suitable for one of the plurality of cell types;

allowing the flow to continue sufficiently so as to remove one of the plurality of cell types into the reagent liquid; and

separating the reagent liquid and the sample liquid.

20. The biological assay method according to claim 1, wherein the biochip comprises two microchannels, one a feeding microchannel having a cell reservoir intermediate its ends and the other a reactant microchannel connected to the reservoir by a connecting means comprising:

storing cells in the cell reservoir;

feeding and growing the cells in the cell reservoir by delivering a culture medium through the feeding microchannel; and

delivering reagent liquid through the reactant microchannel.

21. The biological assay method according to claim 1, wherein the biochip comprises two microchannels, one a feeding microchannel having a cell reservoir intermediate its ends and the other a reactant microchannel connected to the reservoir by a connecting means comprising:

storing cells in the cell reservoir;
feeding and growing the cells in the cell reservoir by delivering a culture medium through the feeding microchannel; and
delivering a reagent through the reactant microchannel, wherein said reagent is selected from the group consisting of chemoattractant toxic substance and cell-derived chemoattractant.

22. The biological assay method according to claim 1, wherein a plurality of tests are carried out simultaneously using a sample liquid forming portion of a larger sample and using different test conditions.

23. The biological assay method according to claim 1, wherein a plurality of tests are carried out simultaneously using different sample liquids and the same test conditions.

24. The biological assay method according to claim 1, wherein the internal bore of the biochip is coated with a protein.

25. A biochip comprising:

an elongate main microchannel;

an inlet port mounted on the proximal end of the main microchannel;

an outlet port adjacent its distal end;

a separate liquid feeder microchannel connected to the main microchannel, the feeder microchannel having an inlet port; and

an outlet feeder port connecting the feeder microchannel and the main microchannel.

26. A biochip as claimed in claim 25 in which the outlet port between the feeder microchannel and the main microchannel has a restricted throat.

27. A biochip as claimed in claim 25, in which a microchannel connects to a further take-off microchannel intermediate its ends.

28. A biochip as claimed in claim 25, in which the microchannel comprises a main microchannel and take-off microchannel intermediate its ends, the take-off microchannel having an entrance which projects into the main microchannel to divert flow from the main microchannel into the take-off microchannel.

29. A biochip as claimed in claim 25 comprising a microwell connected to a microchannel forming part of the biochip.

30. A biochip as claimed in claim 25 in which there is a microwell connected to the microchannel feeder delivering into and out of the microwell, the feeder microchannel having an inlet port adjacent its proximal end and an outlet port adjacent its distal end.

31. A biochip as claimed in claim 25 in which the microchannel comprises a planar top wall.

32. A biochip as claimed in claim 25 in which the microchannel comprises planar top, bottom and side walls.

33. A biochip as claimed in claim 25 in which the side walls taper outwardly and upwardly away from each other.

34. A biochip as claimed in claim 25 in which the top wall is removable.

35. A biochip as claimed in claim 25 in which the microchannel side and bottom walls are formed in a planar sheet of plastics material and the top wall is formed by a plastics film adhered to the sheet.

36. A biochip as claimed in claim 25 in which each port has a bubble release port and a valve associated therewith.

37. A biochip as claimed in claim 25 in which the cross-sectional area of the microchannel is between 25 μm^2 to 10,000 μm^2.

38. A biochip as claimed in claim 25 in which the cross sectional area of the microchannel is in excess of 400 μm^2.

39. A biochip assembly comprising a plurality of biochips as claimed in claim 25 formed on the one base sheet.

40. A biochip assembly as claimed in 25 comprising a plurality of biochips formed on the one base sheet with a common feeder microchannel having a port therein connected to each of the biochips.

41. A biochip comprising:

two separate elongate main microchannels,

a connecting microchannel between the two separate main microchannels,

an inlet port mounted on the proximal end of each of the main microchannels, and

an outlet port mounted on the distal end of each microchannel.

42. A biochip as claimed in claim 41 comprising a separate liquid feeder microchannel connected to at least one main microchannel, the feeder microchannel having an inlet port and an outlet feeder port connecting the feeder microchannel and the main microchannel.

43. A biochip as claimed in claim 41, comprising:

coating the internal bore of the biochip by seeding the biochip with an endothelial cells; and

allowing the cells to grow and form an endothelial layer on the bore.

44. A biochip as claimed in claim 41 in which the cell is taken from an animal and the bore of the biochip is substantially the same size as the post capillary venules of the animal.

45. A biochip as claimed in claim 41, comprising delivering a reagent liquid at a controlled steady flow rate

through another microchannel connected to the other microchannel, the channels being connected intermediate their ends by an interconnecting channel.

46. A biochip as claimed in claim 41, comprising delivering a reagent liquid at a controlled steady flow rate through another microchannel connected to the other microchannel, the channels being connected intermediate their ends by an interconnecting channel, the fluid pressure of the liquids being so chosen as to cause a diffusion of the reagent through the interconnecting channel and into the sample liquid.

47. A biochip as claimed in claim 41, in which the sample liquid contains more than one cell type in suspension.

48. A biochip as claimed in claim 41, in which the top wall is removable.

49. A biochip as claimed in claim 41, in which the microchannel side and bottom walls are formed in a planar sheet of plastics material and the top wall is formed by a plastics film adhered to the sheet.

50. A biochip as claimed in claim 41, in which each port has a bubble release port and a valve associated therewith.

51. A biochip as claimed in claim 41, in which the cross-sectional area of the microchannel is between 25 μm^2 to 10,000 μm^2.

52. A biochip assembly comprising a plurality of biochips as claimed in claim 41 formed on the one base sheet.

53. A biochip assembly as claimed in claim 41, comprising a plurality of biochips formed on the one base sheet with a common feeder microchannel having a port therein connected to each of the biochips.

54. A biochip comprising:

two separate elongate main microchannels;

a common microchannel connected to each main channel adjacent their distal and its proximal end; and

an inlet port mounted on the proximal end of each of the main microchannels.

55. A biochip as claimed in claim 54, comprising a separate liquid feeder microchannel connected to at least one main microchannel, the feeder microchannel having an inlet port and an outlet feeder port connecting the feeder microchannel and the main microchannel.

56. A biochip as claimed in claim 54, in which the common microchannel feeds two further main microchannels.

57. A biochip as claimed in claim 54, in which a microchannel connects to a further take-off microchannel intermediate its ends.

58. A biochip as claimed in claim 54, in which the microchannel comprises a main microchannel and a take-off microchannel intermediate its ends, the take-off microchannel having an entrance which projects into the main

microchannel to divert flow from the main microchannel into the take-off microchannel.

59. A biochip as claimed in claim 54, in which the microchannel comprises planar top, bottom and side walls.

60. A biochip as claimed in claim 54, in which the microchannel side and bottom walls are formed in a planar sheet of plastics material and the top wall is formed by a plastics film adhered to the sheet.

61. A biochip assembly comprising a plurality of biochips as claimed in claim 54 formed on the one base sheet.

62. A biochip assembly as claimed in claim 54 comprising a plurality of biochips formed on the one base sheet with a common feeder microchannel having a port therein connected to each of the biochips.

63. A biochip comprising:

an elongate main microchannel;

an inlet port mounted on the proximal end of the main microchannel;

an outlet port adjacent its distal end;

a microwell connected to the main microchannel;

a feeder microchannel for delivering liquid into and out of the microwell;

an inlet port adjacent the proximal end of the feeder microchannel; and

an outlet port adjacent the distal end of the feeder microchannel.

64. A biochip as claimed in claim 63, in which the microchannel comprises planar top, bottom and side walls.

65. A biochip as claimed in claim 63, in which the microchannel side and bottom walls are formed in a planar sheet of plastics material and the top wall is formed by a plastics film adhered to the sheet.

66. A biochip as claimed in claim 63, in which each port has a bubble release port and a valve associated therewith.

67. A biochip assembly comprising a plurality of biochips as claimed in claim 63 formed on the one base sheet.

68. A biochip assembly as claimed in claim 63 comprising a plurality of biochips formed on the one base sheet with a common feeder microchannel having a port therein connected to each of the biochips.